

REMARKS

I. INTRODUCTION

Claim 1-19 remain pending in the present application. No new matter has been added. In view of the following remarks, it is respectfully submitted that all of the pending claims are allowable.

II. THE 35 U.S.C. § 102(b) REJECTIONS SHOULD BE WITHDRAWN

Claims 10-17 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 4,335,214 to Levy et al ("Levy"). (11/02/06 Office Action page 3). In the "Response to Arguments" section, of the 11/02/06 Office Action, the Examiner opined that "Levy teaches canceling the echo in a received signal using a feedback." (11/02/06 Office Action page 2). The Examiner describes the functioning of the invention taught by Levy as:

"... demodulating a reflection (received) signal into in-phase and quadrature signal (see figure 3, element 36), filtering the in-phase signal to isolate an in-phase error signal, filtering the quadrature signal to isolate the quadrature error signal (see figure 3, element 31), modulating the in-phase error signal and quadrature error signal to create a feedback signal (see figure 3, element 32), and combining the reflection signal and the feedback signal to cancel at least a portion of echo signals in the reflection signals (see element 34). Thus Levy teaches cited limitations." (11/02/06 Office Action page 2).

Applicants respectfully submit that the Examiner has described Levy incorrectly. A fundamental difference exists between Levy and claim 10. In Levy, the focus is on "the signal transmitted over the transmission line, from which the echo signal is derived." (Levy col. 4, ll. 31-32).

Claim 10, unlike Levy, calls for the recited error signals to be derived not from a transmitted signal, but from a received signal, namely, the reflection signal. In Levy, although the received signal is indeed demodulated by element 37, that signal is not the signal that is filtered to isolate the error. The signal that is demodulated by element 37, is used by the digital complex

transversal filter (figure 3, element 31) for the exclusive purpose of generating “weighting coefficients,” the signal itself is never filtered. (Levy col. 11, ll. 54-59). Thus, the demodulated received signal in Levy is fed to filter 31 not so it can be filtered, but so it can serve as a basis for producing weighting coefficients. The other signal fed to filter 31, namely the transmission signal from select circuit 23, is what is filtered to produce an echo signal. That is, the signal that is filtered and later modulated by the digital modulator (figure 3, element 32) and eventually combined with the received signal by the subtracting circuit to cancel out the echo signal (figure 3, element 34), actually comes from the select circuit (figure 3, element 23) on the transmission side; it does not come from figure 3, element 36. Even with the broadest interpretation of the claim language, the claimed invention would not cover (or be taught by) Levy because the rule of antecedent basis mandates that only the reflected signal may be used as a feedback signal in the claimed invention. Since the echo signal in Levy is derived from the transmission signal, and not from any received signal, Levy fails to teach isolating error signals by filtering a reflection signal, as recited in claim 10.

Further, the Applicants respectfully stand by their earlier arguments reiterated below:

Levy discloses an echo canceller for full duplex synchronous data transmission (Levy col. 3, ll. 6-30; Levy, fig. 3). Levy describes an echo canceller that uses a digital time-domain complex transversal filter which in turn uses the original output signal as part of its input. (Levy col. 11, ll. 20-25).

Claim 10 recites “demodulating *a reflection signal* into an in-phase signal and a quadrature signal; filtering the in-phase signal to isolate an in-phase error signal; filtering the quadrature signal to isolate a quadrature error signal; modulating the in-phase error signal and

the quadrature error signal to create a feedback signal; and combining *the reflection signal* and the feedback signal to cancel at least a portion of radio frequency echo signals in *the reflection signal*.” The claimed invention uses exclusively the reflected signal (the signal received by the antenna) to perform filtering and echo cancellation. Levy, on the other hand, uses the original output signal to perform the filtering of the error signal and echo cancellation. (Levy col. 11, ll. 20-25). Levy uses the received input signal only for the purpose of “control[ling] the weighting coefficients of ... [the] filter,” a process unnecessary in the claimed invention. (Levy col. 11, ll. 54-59). The Levy patent neither teaches nor describes nor suggests the use of a feedback loop in conjunction with *a reflected signal*. Rather, Levy uses the original output signal together with weighting coefficients, derived from a new, received input signal on the same frequency, to generate the feedback signal. (Levy col. 11, ll. 20-25; Levy diag. 3 elements 23, 31, 37). This is a major difference because the invention in the Levy patent requires the preservation of the original signal in order to perform the echo cancellation, whereas the disclosed invention works exclusively with the received, reflected signal. In light of this distinction, it is respectfully submitted that the rejection of claim 10 should be withdrawn. Because claims 11-13 depend from, and therefore include all the limitations of, claim 10, these claims are also allowable.

Claim 14 recites “a demodulator to demodulate *a reflection signal* into an in-phase signal and a quadrature signal; a first filter to isolate an in-phase error signal from the in-phase signal; a second filter to isolate a quadrature error signal from the quadrature signal; a modulator to modulate the in-phase error signal and the quadrature error signal to create a feedback signal; and a combiner element to combine *the reflection signal* and the feedback signal to cancel at least a portion of radio frequency echo signals in *the reflection signal*.” For same reasons discussed with reference to claim 10, this is also allowable. It is respectfully submitted

that the rejection of claim 14 should be withdrawn. Because claims 15-19 depend from, and therefore include all the limitations of, claim 14, these claims are also allowable.

III. THE 35 U.S.C. § 103(a) REJECTIONS SHOULD BE WITHDRAWN

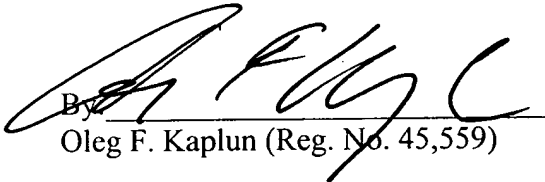
Claims 1-9, and 19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over by U.S. Patent No. 6,236,315 to Helms ("Helms") Helms and Levy. (11/02/06 Office Action page 4). As the Examiner stated, Helms "is silent on combining the reflection signal and a feedback signal to cancel at least a portion of radio frequency signals in the reflection." (11/02/06 Office Action page 5). For the same reasons as discussed with reference to claims 10 and 14, it is respectfully submitted that the neither the Helms patent nor the Levy patent, either alone or in combination, disclose or suggest "a system, comprising: a transmitter element creating an interrogation signal and transmitting the interrogation signal; and a receiver element receiving *a reflection signal of the interrogation signal and combining the reflection signal and a feedback signal to cancel at least a portion of radio frequency echo signals in the reflection signal*," as recited in claim 1, or "a method comprising the steps of: receiving a *reflection signal*; deriving a *feedback signal from the reflection signal* by isolating an error component of the *reflection signal*; and combining the *reflection signal* and the *feedback signal* to cancel at least a portion of radio frequency echo signals in the *reflection signal*," as recited in claim 8. Instead of combining a feedback signal with a reflection signal, as recited in claims 1 and 8, Levy combines via subtractor 34 a feedback signal from DAC 33 with the transmission signal from unit 20. It is respectfully submitted that claim 1 and claim 8 and all claims depending therefrom are allowable and the rejection under 35 U.S.C. § 103 should be withdrawn.

CONCLUSION

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

Dated: January 31, 2007


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